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BOOK REVIEWS

Il metodo degli equivalenti. Contributo allo studio dei processi di confronto. By AGOSTINO GEMELLI. Firenze, 1914. Libreria Editrice Fiorentina. pp. 344.

This monograph is an attempt to work out experimentally, in the field of the comparison of cutaneous distances for different parts of the body, those factors that may influence the method of equivalents. The treatment naturally falls into three parts:—1. an experimental attack upon the factors involved in the method from the purely quantitative side; 2. a statistical attack upon the influence of the factor of the use of visual imagery in making the judgments; and 3. an attempt at an introspective analysis from the qualitative side of the comparison judgment under his experimental conditions. The work was prepared under the guidance of Professors Kiesow and Külpe and clearly shows the influence of both men.

Gemelli invented a new aesthesiometer for his experiments, which not only has the advantage of being exceedingly handy and usable, but also,—and this is of much greater importance,—which enables one to control the intensity of the stimulation as well as the distance between the points. In his experiments, Gemelli employed that technique of the method of equivalents which has become known as procedure G. The following parts of the body were stimulated in successive fashion:

1. forehead—lower arm;
2. lower arm—chest;
3. lower arm—back;
4. forehead—chest.

The standard distances varied from threshold values to 12 cm. The ratios of the subjective equivalents to the objective values of the standards are found to be very similar to those obtained by Miss Washburn. These ratios set in with very high values and decrease as the extent of the standard increases. This decrease is found to be constant up to standards of about 8 cm. and then the values of the ratios increase again. The value of this ratio also depends on the sensitivity of those parts of the body that are stimulated, and it is found that the ratio becomes larger the greater the difference in sensitivity of the two points stimulated. This Gemelli believes is an index that the ratio increases along with the difficulties that present themselves to the subject in comparing the two distances. Another factor studied is the effect of the intensity of the stimulation or the amount of pressure exerted by the stimulus. It is found that as the pressure is increased the ratio more nearly approaches unity. Hence Gemelli studies experimentally various factors that may influence the results of this method in the tactual field. He makes no effort to study those formal considerations which constitute the basis of the method, nor does he attempt any consideration of the formal relations between this and the other psychophysical methods.

Gemelli now attempts to determine statistically the effect of the

presence or absence of visual images in a comparison judgment under these conditions. This is studied by determining the ratios for sensations on the forehead and on the arm held in different positions. In one group of experiments the arm is held along the body, while in the other it is abducted as far as possible. It is found that cutaneous distances on the arm are underestimated when that member is extended, as compared with judgments when the arm is held in the normal position. Thus the results show very clearly that distances on any part of the body are underestimated when that part is removed as far as possible from the medium line. These differences Gemelli believes to be due to the presence of visual images when the part is abducted. This contention he attempts to prove by experimentation upon two congenitally blind subjects, who cannot, in the nature of things, make use of visual imagery. For these blind subjects, no such differences in underestimation are to be noted with the arm in the two positions.

In the third part of the monograph, Gemelli attempts an introspective analysis of the comparison judgment under his experimental conditions. For this purpose he employs the method of systematic experimental introspection as advanced by Külpe. Such a comparison judgment is considered to be a thought process and hence is capable of analysis by this experimental method. The single process of comparison reduces to the following steps:

1. Preparation of the subject to the process of comparison;
2. Apperception of the standard stimulus;
3. Pause;
4. Apperception of the comparison stimulus;
5. Formation of the judgment;
6. Expressing of the judgment.

Each of these steps is then analysed; and in regard to the first, the preparation of the subject to the comparison process, the matters of *Aufgabe* and *Einstellung* are discussed. The factors that form the basis of the judgment are found to be of two general sorts. 1. Mediating procedures, which make use of either, a. visual imagery; b. kinæsthetic imagery; or c. the use of categories. This use of categories is obviously the passing of an absolute judgment upon each of the cutaneous distances. Besides these we have 2. immediate procedures which include, a. successive observation of the two distances; or b. relative observations of the two distances. The immediate procedures are utilized by the subjects when the differences between the two distances are very great and hence the judgment is comparatively easy. When the differences between the two distances that are to be compared are very small, the mediating procedures are brought into play.

This monograph shows some very careful work on the part of the experimenter and is of great value for two reasons. In the first place, it has renewed the interest in the method of equivalents. This method, in its present form, does not give a determination of the measure of sensitivity of the subject, but on the other hand, from it we perhaps get a better understanding of the meaning of the point of subjective equality than from any of the other psychophysical methods. Unfortunately Gemelli does not attempt to give a formal analysis of the method, but his analysis of the experimental factors is of the greatest value. In the second place, the work is of great value because Gemelli has attempted an analysis of the comparison consciousness from the qualitative side. All of the psychophysical methods stand sorely in need of such an analysis. Whether the reader agrees or dis-

agrees with the analysis made by Gemelli, does not affect the fact that such an attempt is a step decidedly in the right direction. It would appear to the reviewer that Gemelli has made a more complete analysis of the particular consciousness under observation than has yet been done in any of the Würzburg studies. And this analysis has been made from a purely psychological attitude toward the problem and without any appeal to philosophy. Unfortunately, it seems to the reviewer, that Gemelli does not publish sufficient introspections to confirm his analysis.

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The Influence of Distractions on the Formation of Judgments in Lifted Weight Experiments. By DAVID MITCHELL, Ph. D. The Psychological Monographs, Vol. XVII, No. 3 (Whole No. 74), 1914. pp. 58.

On the basis of introspection most psychologists have divided attention into at least two sorts—voluntary and involuntary. It is the purpose of this investigation to induce two states of mind which may be characterized by these terms and to study the influence of each upon the formation of judgments. The experiments were carried on in the field of lifted weights. The space errors were eliminated and the weights were presented in the first time order. Two types of sound distractions were employed: 1. a continuous sound made by an electric buzzer to which the subject was instructed not to attend, and 2. the counting of separate clicks—from one to six in number—simultaneously with the lifting of the comparison stimulus. "In the first group the distraction was produced by a sensory stimulation without a concomitant mental activity otherwise induced. In the second group, the work of counting the clicks was a prominent feature of the mental process involved" (p. 33). That Mitchell succeeded in inducing the desired states of mind by means of these distractions is attested by the reports of the observers.

The apparatus employed for the production of the distractions was rather complicated but exceedingly clever and efficient. It was necessary to have the distracting sound exactly, or almost exactly, concomitant with the lifting of the proper weight. This the experimenter obviously could not do. So Mitchell devised a means by which the actual lifting of the weight mechanically actuated the distracting stimulus. Hence the differences in time between the lifting of the weight and the starting of the distraction were exceedingly small.

The experiments were so arranged that normal series without distractions were mingled with the distraction series of both types and so were taken under the same objective and subjective conditions. Four subjects were employed in this investigation and in all over 75,000 individual judgments were recorded; a number amply sufficient to give authority to the results. The data was collected in accordance with and subjected to the calculations of the method of constant stimuli as developed by Urban.

The results show that, contrary to the traditional view, a distraction such as those employed in this experiment tends to produce greater precision of judgment; or in other words, in the presence of a distraction the judgments of the subject are more consistent. This is shown by the greater size of the value of h of the $\Phi(\gamma)$ hypothesis for the series in which the distractions were present. Also this presence of distractions increases the sensitivity of the subject. The